

Medications Risk and Pregnancy: Perception and Practice of Pharmacists in Gondar Town, North West Ethiopia. A Cross-Sectional Study

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ABSTRACT

Background: Medications use during the gestation period is common. Pharmacy professionals are the most available health practitioners and have an important role in medication safety during pregnancy. This study aimed to assess the perception and practice of pharmacy professionals towards the risk of medication use during pregnancy in Gondar town.

Method: A cross-sectional survey was conducted on pharmacists who are working in community and hospital pharmacies in Gondar town, northwest Ethiopia. Data were collected using structured questionnaires measuring perception, and practice of respondents through face-to-face interviews. The collected data were entered and analyzed using Statistical Packages for Social Sciences (SPSS) version 24. Descriptive and Student's t-test analyses were used to describe and assess the association between different variables. The results were presented in numbers, percentages, and mean (\pm SD and 95% CI).

Results: Out of 137 pharmacy professionals invited to participate, 135 were completed the survey with a 98.5% response rate. The mean age of respondents was 28.64 years with a standard deviation of \pm 5.0. The majority of respondents (57.8%) had more than five years of work experience. There was a significant difference observed in the perception and practice of respondents towards the risk of medication use during pregnancy. Among total respondents, 48.4% of them had a poor perception and more than half of the participants (55.6%) agreed that all currently available drugs are safe during pregnancy. More than half of respondents (56.7%) had poor practice and 65.2% of respondents did not ask whether there is pregnancy or not. Additionally, there was a significant difference observed for educational qualification, age, and years of experience of the pharmacists in their score of perception test ($p=0.005$, $p=0.019$, and $p=0.014$, respectively). Similarly, there was a significant difference seen in their score of perception test; sex ($p=0.039$), age ($p=0.043$), and working sectors ($p=0.001$).

Conclusion: This study revealed that there is a wide gap in perception and practice of pharmacists towards the risk of medication use during pregnancy in the study area. This gap can be fulfilled by providing focused educational intervention to all pharmacists.

Key words: Pharmacy professionals; Pregnancy; Medication; Perception; Practice; Teratogen; North West Ethiopia

INTRODUCTION

According to the World Health Organization, pregnancy is defined as "woman carries an embryo and fetus in her womb for nine months". For most women, this is a time of great happiness and fulfillment [1]. The physiological alteration during pregnancy has important impacts on drugs' pharmacokinetics and pharmacodynamics [2]. The use of drugs during pregnancy can't be completely avoided because most pregnant women may have acute or chronic diseases and currently, more than ninety percent of pregnant women use a minimum of one drug during the gestational period [3]. These medications might have teratogenic effects on

pregnant women and unborn children. The teratogenic outcome of the drug depends on the dose of drugs, route of administration, length of treatment, and gestational period. The use of teratogenic drugs during pregnancy results in damage to the embryo, which will end up within either spontaneous abortion or intact in growth [4].

Dispensing drugs to pregnant women needs special attention due to the potential deleterious effect of the drugs on the mother and unborn fetus [5]. Pharmacists can make a positive influence on pregnancy medications by ensuring the appropriateness of drug therapy and have a pivotal role in drug safety for pregnant

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women, controlling and managing medication adverse events during pregnancy [6]. They are the main performers in managing medication users during pregnancy as they are often the first line of contact and the last professional seen by patients after medicines have been prescribed. Well-appointed with knowledge of pharmacotherapy, as well as skills in health education and chronic disease management for pharmacists, could help them to prevent drug-related issues in pregnancy [5,7]. Therefore, pharmacy professionals should have been experts on drugs mechanism of action, drug interaction, pharmacokinetics profile, and adverse effects. They are also well-equipped with the tools to counsel the patients about the risks and benefits of drugs, herbal and over-the-counter medications [8].

Updating of pharmacists' Perception and practice about treatment in pregnancy is mandatory and could enhance pharmacists' role in improving maternal health. There is a pressing need to stress the significance of continuing pharmacy schooling tailor-made to fulfill the necessities of specialized areas. Pharmacists need to be privy to medicinal drugs used all through pregnancy and must be acquainted with the risks and benefits of the prescribed medications [9]. An across-sectional study done in Beirut and Lebanon showed that pharmacists with work experience of more than ten years had the highest percentage [10].

An observational cross-sectional study conducted in Curitiba (Brazil) revealed that pharmacists dispensing medications were not capable of taking to mean information on the use of medications by pregnant women, and they did not have reliable information sources on the use of medications during pregnancy [11].

Studies in India showed that Community pharmacists are having an encouraging perception and beliefs about safe medication use during pregnancy; and still, there is a wide gap in knowledge levels and practices of Pharmacists towards safe medication use during pregnancy [7].

The study conducted in Saudi Arabia showed that most pregnant women had an encouraging perception towards drugs in general but they thought pregnant women should be more careful about medication use during pregnancy. There was a significant association was found between participants' education and occupation and beliefs about medications usage during pregnancy [12].

To the best of our knowledge and search, there is a paucity study in Ethiopia to explore pharmacists' Perceptions and dispensing practice on the risk of medication use during pregnancy. Therefore, the present study aimed to assess pharmacists' perception, and practice towards the risk of medication use during pregnancy.

METHODS

Study design and setting

A cross-sectional study was conducted on 137 licensed pharmacy professionals from May 1 to June 28, 2019, Gondar town, Northwest Ethiopia. Gondar town is located 750 kilometers away from Addis Ababa, the capital city of Ethiopia. It is one of the ancient and densely populated towns in Ethiopia. Now a day, the town has one specialized referral hospital, two private general hospitals, five health centers, 58 medication retail outlets (24 pharmacies and 34 drug stores), and 137 licensed pharmacy professionals.

Sample size determination and procedure

The source of the population was all dispensers working in private

and governmental health sectors in Gondar town. In this study, all licensed pharmacy professionals who were participating in drug dispensing in the private and governmental institutions during the study period in Gondar town were included.

Data collection tool and personnel

Data collection was done by three graduating class pharmacy students through a self-administered questionnaire. The data collectors were appropriately trained on the data collection tool and ways of approaching the professional and securing their permission for giving information before the data collection process. The data collection tool was developed after a thorough literature review of published studies [7,13,14].

The tool was pretested on 5 pharmacy professionals who were not included in the final analysis and relevant modifications were done before the commencement of actual data collection. The final questionnaire was constituted 24 items that were divided into five main sections (Annex). The first section was focusing on the socio-demographic characteristics of the respondents, including age, gender, and years of practice educational qualification, working sector, and parental status. The second section aimed at assessing the perception of respondents toward the risk of dispensing the drug to pregnancy. Five-point Likert scale was used for accessing perception and practice scores and scoring was given as: strongly agree=5, agree=4, neutral=3, disagree= 2, strongly disagree=1, the midpoint is 3. Also, reverse coding was used for negative statements. The maximum total score for these sections was 40. The obtained score of perception was then classified using mean and standard deviation as "Good perception" (score of 26.7-40), "Moderate perception" (score of 13.4-26.6), and "Poor perception" (score of 0-13.3). Pharmacists' practices were assessed using questions on counseling, properly give instruction, checking the appropriateness of medication, discussing adverse effects, and drug interaction, which was answered as either "yes" or "no."The respondents' practice levels were assessed using scores: +1 for every positive answer and 0 for negative answers and the maximum score was 7. The obtained score of practice was then classified using mean and standard deviation as "Good practice" (score of 4.7-7), "Moderate practice" (score of 2.4-6.6), and "Poor practice" (score of 0-2.3). The final section (has two questions) was to assess sources of information for pharmacists regarding pregnancy medicine.

Data analysis

The final collected data were checked for completeness and entered into and analyzed using Statistical Package for the Social Sciences (SPSS) software version 24.0 for Windows. Frequencies and percentages were used to express different variables. One-way ANOVA was carried out to determine factors associated with the perception, and practice of pharmacists towards to risk of medication in pregnant women. All statistical tests were performed using $p < 0.05$ consider as cut off points for declaring statistical significance.

RESULTS

Socio-demographic characteristics and factors associated with the perception and practice of respondents towards the risk of medication use in pregnancy

Out of 137 pharmacists invited to participate, 135 of them completed the survey giving a response rate of 98.5%. The mean

age of respondents was 28.64 years with a standard deviation of ± 5.0 . The majority of the respondents (61.5%) were male and bachelor degree holders (58.5%). Among total respondents, near to two-third (65.9%) were within 20–29 years of age group. Among total respondents, only 23.7% of pharmacists got training about Maternal-Fetal medication in their lifetime and 43.5% of them took training only once time. The socio-demographic characteristics of respondents are summarized in Table 1.

One-way ANOVA with a post hoc test showed a significant difference in the perception and practice of pharmacists towards the risk of medication use during pregnancy among respondents. The overall mean perception score was higher in ages ranged from 30 to 39 years (mean: 23.37 (1.87), *p*-value 0.019) than age ≥ 40 (mean: 18.40 (0.89)). However, the overall mean practice score was higher in those age ≥ 40 years (mean: 36.00 (8.71), *p*-value 0.043) than those whose age between 20-29 years (mean: 28.41 (6.53)). Pharmacists with a work experience greater than five years had higher perception mean score (mean: 21.39 (2.06), *p*-value 0.014) than those whose work experience is less than five years (mean: 18.85 (2.10)). The pharmacist who works in hospital pharmacy had the highest mean score of perception (mean: 19.28 (1.60), *p*-value 0.019) than those who work in the community (private) pharmacy

(mean: 19.28 (1.60) and health center pharmacy (mean: 15.30 (2.21)). The overall perception and practice scores were highest in those whose educational qualification was MSc (mean: 18.00 (4.24), *p*-value 0.005), and (mean: 36.50 (6.26), respectively). Similarly, the perception and practice score was higher in those who had B. pharm (mean: 14.85 (2.04), *p*-value 0.005) and (mean: 33.52 (5.71), respectively) than in those who had D. pharm (mean: 12.45 (2.06), *p*-value 0.005) and (mean: 32.64 (7.40), respectively) (Table 1).

The perception of pharmacy professionals towards the risk of medication use during pregnancy

The overall mean score of perception was 19.59 ± 1.08 , which falls within our definition of "Moderate perception". Of the total participants, 48.4% had a poor perception, 32.3% had a medium level of perception, and the remaining 19.3% of respondents had a good perception of the risk of medication use in pregnancy. The descriptive results illustrated in Table 2 showed that about 35.5% of respondents agreed that extra caution is required during drug dispensing for pregnancy. Among respondents, 55.6% of them agreed and 18.5% strongly agreed that most of the currently available drugs are safe during pregnancy. About 30.4% of participants were

Table 1: Socio-demographic characteristics and factors associated with the perception and practice of respondents towards the risk of medication use in pregnancy, Gondar, 2019 (N=135).

Variables	Frequency (%)	Total mean perception score		Total mean practice score	
		Mean (SD)	<i>p</i> -value	Mean (SD)	<i>p</i> -value
Gender			0.010*		0.039*
Male	83 (61.5)	19.86 (2.14)		28.90 (7.03)	
Female	52 (38.5)	24.17 (1.92)		34.69 (6.42)	
Age groups in years			0.019*		0.043*
20-29	89 (65.9)	19.76 (2.20)		28.41 (6.53)	
30-39	41 (30.4)	23.37 (1.87)		31.90 (7.32)	
≥ 40	5 (3.7)	18.40 (0.89)		36.00 (8.71)	
Work experience			0.014*		0.215
<5	57 (42.2)	18.85 (2.10)		33.91 (6.38)	
≥ 5	78 (57.8)	21.39 (2.06)		32.42 (7.17)	
Educational qualification			0.005*		0.213
D.pharm	54 (40)	12.45 (2.06)		32.64 (7.40)	
B.pharm	79 (58.5)	14.85 (2.04)		33.52 (5.71)	
MSc	2 (1.5)	18.00 (4.24)		36.50 (6.26)	
Working sector			0.019*		
Community	72 (52.9)	17.86 (2.32)		36.33 (5.30)	0.001*
Hospital	50 (36.8)	19.28 (1.60)		28.34 (6.49)	
Health center	13 (9.6)	15.30 (2.21)		33.00 (5.57)	
Children /parent status			0.311		0.023*
Yes	70 (51.9)	19.68 (1.99)		34.50 (6.66)	
No	65 (48.1)	16.43 (2.15)		30.72 (6.78)	
Have training about Maternal-Fetal medication?			0.002*		0.035*
Yes	32 (23.7)	17.2 (1.36)		23.78 (4.34)	
No	103 (76.3)	8.57(1.23)		19.01 (3.87)	
If yes, then how many times? (n=23)			0.023*		0.033*
1 time	10 (43.5)	14.10 (1.49)		32.40 (5.56)	
2 times	8 (34.9)	15.45 (2.13)		28.45 (4.73)	
≥ 3 times	5 (21.6)	18.64 (2.77)		25.00 (5.04)	

*significant association (P-value less than 0.05); D. pharm=Diploma certificate in pharmacy; B.Pharm= Bachelor degree in pharmacy

believed that teratogenicity associated with drug use is exaggerated. Most of the respondents (51.9%) were strongly agreed that extra caution is required while dispensing during pregnancy. Among the respondent, 28.1% of the respondent believed that the use of herbal medicine during pregnancy is not harmful (Table 2).

The practice of pharmacy professionals towards dispensing medicines to pregnant women

The overall mean practice score of respondents was 4.34 ± 1.87 , which falls within our definition of "Poor practice". More than half of pharmacists (56.7%) had poor practice, 37.8% had a medium level of practice, and the remaining 5.7% of respondents had good practice about the risk of medication use in pregnancy. From the total pharmacists, only 34.8% of them ask pregnancy status and the presence of other co-morbidities. Among total respondents, near to two-third (60.7%) of respondents were never given information about non-prescription drugs that not to be taken during the pregnancy period. Among the respondents, more than half (57.7%) pharmacists reported that they never told drug-drug/food/herbal interaction and common adverse reactions of the drugs when dispensing drugs to pregnant women (Table 3).

Information sources of pharmacists regarding pregnancy medicine

Pharmacists were asked to indicate the preferred sources of information which they used to prepare themselves for providing advice to pregnant women. The commonly cited sources of

information about medication use in pregnancy were books 88 (65.2%), websites 39 (28.9%) journal articles 5 (3.7%), and newspapers 3 (2.2%).

DISCUSSIONS AND CONCLUSIONS

This study assessed the pharmacists' perception and practice towards the risk of medication use during pregnancy in Gondar town, which is located in Northwest Ethiopia. Drugs use throughout the pregnancy period is common. Pharmacy professionals should fastidiously appraise the potential risks of medication use during pregnancy.

Pharmacists must provide full information regarding the benefits and risks of medication use and empower women to make decisions for them and their babies [15]. Pharmacists have great potential to modify and optimize drug therapy in pregnancy [16]. However, the current evidence showed that they didn't actively offer this care and they are least inquisitive about doing this.

Studies on pharmacy professionals' perception and practice regarding drug safety during pregnancy are limited. To our knowledge, this is the first study that was conducted to evaluate the pharmacy professionals' perception and practice about drug use in pregnant women in Gondar, Ethiopia. In pregnancy, drug treatment needs a special concern due to fear of potential teratogenic effects of the drug [17].

It is known that many medications are teratogenic [18]. Numerous medications have confirmed to associate with increased risks of

Table 2: Perception of respondents regarding prescribing during pregnancy, 2019 (N=135).

No	Statement	Response N (%)				
		SD	DA	NT	AG	SA
A1	Extra caution is required while dispensing drugs during pregnancy	7(5.2)	3(1.2)	70(51.9)	48(35.5)	7(5.2)
A2	All OTC drugs are safe in pregnant women	5(3.7)	21(15.6)	26(19.3)	65(48.1)	18(13.3)
A3	Most of the presently available drugs are safe during pregnancy	2(1.5)	20(14.7)	13(9.6)	75(55.6)	25(18.5)
A4	Teratogenicity associated with drug use is over exaggerated	9(6.7)	47(34.8)	26(19.3)	41(30.4)	12(8.9)
A5	Only some drugs are proven teratogen	3(1.2)	7(5.2)	7(5.2)	48(35.5)	70(51.9)
A6	I am confident about dispensing drugs during pregnancy	3(2.2)	16(11.9)	31(23)	57(42.2)	28(20.7)
A7	Topically applied medicines might be harmful during pregnancy	6(4.4)	10(9.7)	57(42.2)	31(23.0)	28(20.7)

SD=strongly disagree, DA= disagree, NT= neutral, AG= agree, SA= strongly agree

Table 3: Frequencies in which drug dispenser tell basic drug information to pregnant women, June 2019 (N=135).

No	Statements	Response (N %)	
		Yes	No
P1	Do you ask the pregnancy status and the presence of other co-morbidities?	47(34.8)	88(65.2)
P2	Do you counsel pregnant women regarding to non-prescription drugs which are not taken during pregnancy period?	53(39.3)	82(60.7)
P3	Do you counsel pregnant women regarding to prescription drugs which are not taken during pregnancy period and change it by consulting the physician?	71(52.6)	64(47.4)
P4	Do you counsel pregnant women about herbal medicine which should not be taken during pregnancy?	32(23.7)	103(76.3)
P5	Do you go through any drug information resources for any unknown drug before dispensing?	39(28.9)	96(71.1)
P6	Do you regularly update your knowledge about safe medication dispensing practice?	42(31.1)	93(68.9)
P7	Do you counsel possible drug-drug/food/herbal interaction and common adverse reaction of the drugs to pregnant women?	57(42.3)	78(57.7)

birth defects. Many medications used to treat diseases such as hypertension and seizures are categorized as class D or X, which are considered potentially teratogenic drugs [19]. In addition, there are numerous drugs with other ratings that, depending on the timing of drug use and the dose of the exposure, can also cause fetal damage [19]. In the present study among respondents, 55.6% of them agreed and 18.5% strongly agreed that most of the currently available drugs are safe during pregnancy. It has documented that CPs do not always offer correct advice to pregnant women [20].

The lack of well-designed focused didactic or training and the scarce availability of continuing education programs about drugs usage in pregnancy may contribute to the inadequate perception of pharmacy professionals towards the risk of medication use during pregnancy. Pharmacists do have a big role in providing information about over the counter drugs, herbal medicines, dietary products, and unwanted effect of medications [21]. Pharmacy professionals were conscious that medication usage during pregnancy could potentially interact with other medicines and bring unpredictable adverse drug reactions in pregnant women and fetuses [22]. In the present study, most of the Pharmacists 78 (57.7%) are not responsive about drug-drug/food/herbal interaction and common adverse reaction of the drugs to pregnant women, but a less number of Pharmacists 57(42.3%) are aware about drug-drug/food/herbal interaction and common adverse reaction of the drugs to pregnant women. Therefore, there is clearly a need to give pharmacy professionals with further pertinent information to better advice pregnant women in this aspect.

The current finding suggested that the majority of the respondents had poor perception and practice habits towards the risk of medication use during pregnancy. This might be due to the lack of well-designed focused training, the scarce availability of continuing education programs about drugs used in pregnancy, and the lack of experience in dispensing medication to pregnant women. As pharmacy professionals are medication experts, they are expected to have a sound perception and practice about medication that is used during pregnancy. Similar findings were reported in different countries [19,20,23,24].

Among respondents, 65.2% of the participants in this study were never asking about pregnancy status and the presence of other co-morbidities before dispensing medicines; whereas 47(34.8%) of the respondents, were asking about pregnancy status and the presence of other co-morbidities before dispensing medications to pregnant women. The majority of pharmacy professionals, 82(60.7%) pointed out that they were not confident about giving counseling concerning non-prescription drugs which are not taken during pregnancy, However, 53(39.3) % of pharmacy professionals were counseling pregnant women concerning to non-prescription drugs. Likewise, 64(47.4%) of the participants were not confident about giving advice and counseling to pregnant women concerning to prescription drugs which are not taken during pregnancy, but 71(52.6%) of pharmacy professionals were confident about giving advice and counseling to pregnant women concerning to prescription drugs. However, a study conducted in Dessie Town, Northeast Ethiopia showed that 97.3% of the pharmacy professionals were asking about pregnancy status before dispensing medicines. But 2 (2.7%) were never asking about pregnancy status before dispensing medications. About half of the study participants responded that they have

Sufficient perception and 70% were confident about giving advice and counseling to pregnant women (16). Similarly, a study

conducted in Kuwait revealed that the majority of pharmacists indicated that they have adequate perception (61.5%) and confidence (58.3%), respectively [25]. This difference in telling basic drug information to pregnant women by dispenser might be due to lack of well-made focused training and the scarce availability of continuing education programs concerning to risk of medication use during pregnancy in Gondar town, northwest Ethiopia. Partial consideration of medication risk during pregnancy by pharmacy professionals could also impact pregnant women who tend to assess risks subjectively [26].

Among total respondents, more than two-thirds (71.1%) of respondents never went through any drug information resources for any unknown drug before dispensing for pregnant women. Accordingly, it is reasonable that training is very important to build up pharmacy professionals' skills in data assessment and risk enunciation; hence vital information can be communicated consistently to increase pregnant women's health outcomes.

A study conducted in Australia, USA and Lithuania showed that pharmacy professionals come into view to have considerable involvement in managing short-term pregnancy-induced ailments by recommending and selection of over the counter drugs for pregnant women and to repeat physicians' recommendations [22,23,27,28]. In the present study, among respondents, 48.1% of them agreed and 13.3% strongly agreed that all Over the counter (OTC) drugs are safe in pregnant women. The difference observed may be due to lack of training in drugs used during pregnancy, a lack of available resources, and fail to upgrade their educational qualification.

A very excessive teratogenic threat perception of health care experts used to be documented [29], 89% (strongly agreed and agreed) believed that they have been capable enough to inform pregnant women about their medication [19]. In line with this, the current study suggests that 62.9% of respondents pronounced that they had confidence in dispensing drugs during pregnancy.

In the current study, pharmacy professional's perception was strongly associated with the year of experience (p -value = 0.014). However, in the study conducted in Qatar, work experience was not associated with their perception of pharmacists [19]. The disparity observed concerning years of experience may be credited to the reality that pharmacy professionals who work for many years will have many encounters compared to the subsequent less experienced pharmacy professionals in dispensing drugs for pregnant women. In addition, this might be attributed to the reality that those very experienced pharmacy professionals might have opportunities to participate in different workshops and training concerning medication risk and pregnancy compared to the corresponding less experienced pharmacy professionals.

In this study, we observed that pharmacy professionals' qualification influences the perception to mean score, however not practice mean score. The respondents who have a master's degree in pharmacy had higher expertise mean score (mean: 8.50 (0.71), p value 0.010) than those who have a diploma (mean: 3.85 (1.91) and bachelor degree (mean: 5.96 (1.56)). This may be attributed to the reality that pharmacy experts who trained MSc and bachelor of pharmacy program had a greater chance to take many courses about the danger of medicinal drug use in the course of pregnancy and had many practical attachments in community pharmacies at some point of their professional education compared to the corresponding druggists. So, the undergraduate and postgraduate

curriculum could provide a better platform for improving pharmacists' perception of medication risk and pregnancy, this finding is in line with a study conducted in Ethiopia and Kuwait [17,25].

The overall mean practice score was higher in those ages ≥ 40 years (mean: 36.00 (8.71), p -value 0.043) than those whose age between 20-29 years (mean: 28.41 (6.53) and 30-39 years (31.90 (7.32). this might be attributed to the fact that pharmacy professionals with age greater than and equal to 40 years are professionally extra equipped towards scientific practice and may have opportunities to participate in distinct workshops and training. This indicated that pharmacy professionals whose age is above forty years of age more likely to have higher years' of experience (practice via experience). This result was in agreement with research conducted in Kuwait [17].

Respondents who work in hospital pharmacies were a higher mean score of perception (p -value 0.019) than those who work in community and health center pharmacy. The possible motive is that they may have a chance to collaborate with different health professionals (physicians, nurses) and additionally, they are close to drug information. However, respondents who work in community pharmacy (private) had better basic mean practice score (mean: 36.33 (5.30), p -value 0.001) than who work in a hospital (mean: 33.00 (5.57) and health center pharmacy (mean: 28.34 (6.49). This would possibly be due to patient load/pressures'. In the hospital, the patient load is very high, so there is no enough time to counsel patients and to implement the basic principle of the pharmacy profession.

As a limitation, even though this survey highlights an area of research where there is a lack of literature in Ethiopia, the warning should be exercised when generalizing to other regions in Ethiopia as the study was a cross-sectional and carried out solely one center (Gondar town only). Thus, being a cross-sectional study makes it much less appropriate to determine definitive cause and effect associations. As the study design is cross-sectional and depends on self-reported assessment, under- or over-reporting is very likely. Nevertheless, this survey has widespread implications for the promotion of rational dispensing of medicine for pregnant women.

Taken as a whole, pharmacy professionals exhibited poor perception and practice towards the risk of medication use during pregnancy. Even if Pharmacists (MSc and B. pharm) had better perception and practice regarding medication usage in the course of pregnancy, there are still gaps in perception and practice where educational interventions are needed. They are aware of medications used in the course of pregnancy and must be acquainted regarding the risks and advantages of the medication used and to provide excellent drug-related statistics to pregnant women and healthcare professionals taking care of pregnant women. The researcher encouraged for the ministry of health ought to take countless means can be hooked up to improve PPs expertise about drug safety during pregnancy such as putting in a pharmacy network system, in community and health center pharmacies to offer immediate information to PPs concerning medications, adding imperative subjects regarding drug safety into the pharmacy curriculum, and creating free pharmacy continuing training programs.

List of abbreviations and acronyms

ANOVA: Analysis of Variance; CPs: Community pharmacists; SoP: School of Pharmacy; SPSS: Statistical Packages for Social Sciences; OTC: Over the counter

Ethical Consideration

The ethical committee of the School of Pharmacy, University of Gondar, approved this study with an approval number of SoP-320/2019. Informed verbal, as well as written consent was obtained from participants before data collection, and the purpose of the study was explained to the respondents in advance. The information collected from respondents was kept confidential.

Availability of Data and Materials

The data sets supporting the finding of this study can be obtained from the corresponding author upon a request.

COMPETING INTERESTS

The authors declared that they do not have any conflict of interest.

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Not applicable

AUTHORS' CONTRIBUTION

ABM and ZDK contributed to designing the study, manuscript preparation, and finalization. MNM contributed to data collection, data analysis, and data interpretation. MA, ZDK, and ABM participated in data analysis, data interpretation, and supervision of the study. All authors read and approved the final manuscript.

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